

Pacific Gas & Electric Co. / Southern California Edison Co.

Establishing an Appropriate Disposal Rate for Low Level Radioactive Waste During Decommissioning

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Disclaimer

This report was prepared by Robert A Snyder, a Low Level Radioactive Waste (LLRW) consultant for Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (Edison). All information contained or referenced in this report is considered to be accurate as of the time of publication.

Abstract

The California Public Utilities Commission (the Commission) requires PG&E, and Edison [acting on behalf of San Diego Gas & Electric Company (SDG&E)], to conservatively estimate their nuclear decommissioning LLRW disposal rates. This paper provides such an estimate, based on an analysis of current relevant factors.

There are three classes of LLRW, corresponding to the degree of hazard. Class A waste is least hazardous and makes up most the volume of waste. Classes B and C are more hazardous but less voluminous. The costs associated with burial of these types of waste are proportionate to their respective levels of hazard.

While disposal facilities are available for Class A waste, generators of LLRW are experiencing limited or no access to disposal facilities for Class B and Class C waste. The Low-Level Radioactive Waste Policy Act of 1980 (the Act), which required each state to provide for the disposal of LLRW generated within its borders, and authorized states to form interstate compacts and to build regional facilities, has not achieved its objective. Although several groups of states have formed interstate compacts for LLRW disposal, only a few compacts operate disposal sites. The Southwestern LLRW Disposal Compact, of which California is a member, has not developed a compact disposal facility.

The EnergySolutions disposal facility in Clive, Utah, is open to waste generators from states that do not have access to in-compact disposal sites, including California. However, this facility only accepts Class A waste. The LLRW disposal facility at Barnwell, South Carolina, accepts Class B and C waste. However, as of July 1, 2008, it is closed to all LLRW generators outside the Atlantic Interstate LLRW Management Compact, including California.

Utilities that do not have access to a LLRW disposal site for Class B and C waste must store these materials onsite or at a vendor facility.

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Executive Summary

Objective

In D.07-01-003, (ref 1) the California Public Utilities Commission (the Commission) ordered Pacific Gas and Electric (PG&E), Southern California Edison (Edison), and San Diego Gas and Electric (SDG&E) (collectively the utilities), to conduct a study to determine Low Level Radioactive Waste (LLRW) base disposal rates for use in connection with nuclear decommissioning proceedings before the Commission. In response to that order, the utilities retained a consultant, Robert A. Snyder, to prepare this position paper, a process in which the utilities actively participated. The utilities will use the base rates identified in this study to represent their best estimate of the cost of LLRW disposal they will incur in connection with decommissioning their nuclear facilities. The identified rates are in 2008 dollars.

Overview of Approach

This study is based on information about LLRW disposal gathered from the federal government, special interest groups, technical materials, and presentations from trade organizations, conferences, and industry peers as identified in the References. Based on this information, the consultant evaluated the LLRW market and trends. Additionally, he evaluated all LLRW disposal sites and ranked them in terms of availability. The information contained in this document is either specifically referenced, or was developed based on proprietary disposal facility contracts.

To determine disposal rates, published rate schedules were obtained from disposal facilities and customers (generators of LLRW) when available. Rate schedules for the Washington (Richland), the South Carolina (Barnwell), and the EnergySolutions (Clive) disposal facilities were available in the public domain. Additionally, proprietary rate

schedules for large contract customers of EnergySolutions were obtained pursuant to non-disclosure agreements, and cannot be provided in this report. However, these confidential contract rates have been used to assist in developing the disposal rates in this report. Additionally, this report addresses the current state of affairs in LLRW management and the unpredictability of future access to LLRW disposal facilities and potential impact on disposal rate dollars.

Conclusions

The large majority of decommissioning waste is Class A LLRW. Access to LLRW disposal sites for Class A decommissioning waste appears to be adequate. A small percentage of decommissioning waste is Class B and C. As of July 1, 2008, there are no disposal options for Class B and Class C waste. Generators of Class B and Class C waste must store this waste onsite or seek a second party storage option. The limited availability of LLRW disposal sites to California LLRW generators due to the states' failure to build new regional disposal facilities under the Low Level Radioactive Waste Policy Act of 1980 is assumed to have increased the waste disposal rates. However, it is impossible to quantify any rate increases related to this failure.

The findings of this report conservatively estimate the disposal rates (excluding State of Utah taxes and the Southwest Low Level Compact Commission fees) in 2008 dollars as follows;

- Class A Bulk waste is \$57 per cubic foot (cuft)
- Class A General waste is \$223 per cubic foot (cuft)
- Class B and Class C waste is \$2,915.00 per cubic foot (cuft).

Introduction

According to D.07-01-003, Ordering Paragraph (OP) 7, "Edison, SDG&E, and PG&E shall serve testimony in their next triennial review of nuclear decommissioning trusts and related decommissioning activities that demonstrates they have made all reasonable efforts to conservatively forecast the costs of low level radioactive waste storage." This report was prepared in compliance with that order. The report provides disposal rates in dollars per cuft for Class B and C wastes, and a breakdown of representative rates for different types of Class A waste. The "cost of low level radioactive waste storage" identified in the order encompasses the disposal rates reported herein. Also see discussion at D.07-01-003, Part IX.A.

Background

The remainder of this section provides an overview of LLRW types, how LLRW is defined through the waste classification system, and how market forces affect disposal site access and capacity. The discussion is a necessary predicate to addressing overall market stability including disposal site availability, access, and the effect of market forces on disposal rates.

Commercial Low Level Radioactive Waste

Disposal costs for commercially generated LLRW from medical, research, academic, and power generation facilities are subject to similar market forces. Thus, disposal rates for a given volume of medical or generation waste tend to be similar. However, because of economies of scale, disposal rates for power generators' waste streams, including waste realized during the decommissioning of nuclear power plants, may be different than disposal rates for waste from medical, research, or academic institutions.

Government Low Level Radioactive Waste

LLRW generated from U.S. government legacy projects are not subject to similar market conditions which effect commercial waste generators. Because commercial LLRW generators do not have access to the same disposal facilities or pricing structures available to the U.S. government, analysis of pricing at U.S. government LLRW disposal facilities is not relevant to this study.

Waste Classification System

10 C.F.R. 61.55 defines three classes of LLRW that are acceptable for near-surface disposal based on nuclide concentration and hazard. Class A waste has the lowest nuclide concentrations and is the least hazardous. Class C waste has the highest nuclide concentrations and is the most hazardous. The disposal system for Class A waste is less robust than it is for Class B and Class C waste. In a typical nuclear power decommissioning project, more than 99% of the waste volume is Class A. The combined volumes of Class B waste, Class C waste, and Greater than Class C (GTCC) waste, which is not considered acceptable for near surface disposal, constitute less than 1% of the waste stream. The pricing schedule, by class of waste, is consistent with the classification system. The disposal of Class A waste is most economical, and can be substantially less than the cost per cubic foot of disposing of Class B and Class C wastes. (ref 2)

Market Factors Affecting Commercial LLRW Disposal Rates

Commercial LLRW market factors that may affect disposal rates include:

- Availability and capacity of disposal sites: The largest disposal facility currently available to California commercial LLRW generators is the EnergySolutions facility in Clive, Utah (Clive). Clive is expected to have disposal capacity for several decades. However, Clive only accepts Class A waste. The only site that accepted Class B and Class C wastes from California commercial LLRW generators closed to non-Atlantic Compact LLRW generators as of July 1, 2008.
- Adequacy of the waste compact system: The opening and/or availability of other sites for commercial LLRW, as required by the waste compact system prescribed in the Low Level Waste Policy Amendments Act of 1985, has been constrained by political or regulatory considerations. No new sites have opened.
- Barriers to entry: No technical barriers exist for near-surface disposal facility operations. Near-surface disposal facilities operate similarly to other landfill

operations and generally have safe operating histories. Several waste management and disposal companies have, however, been unsuccessful in obtaining necessary authorization from states to open new near-surface disposal facilities.

- Use of government sites for commercial waste: The U.S. Government owns disposal facilities for government-generated waste. They are operated by government contractors with fixed profit margins at rates substantially below rates available to commercial LLRW generators. Under current law, however, utilities cannot dispose of commercially-generated waste at government-owned sites.
- Volumes of Waste and Class of Waste: Large volumes of waste are generated during decommissioning of a power facility when compared to waste which is generated during normal power operations or typical waste volumes generated from medical or academic generators. The volume difference is reflected in discounted price models for decommissioning waste not available to smaller volume generators. Further, Class A disposal rates are significantly lower than disposal rates for Class B and Class C wastes.

Assumptions and Bases

The following assumptions listed below, are used in determining the disposal rate for PG&E / SCE decommissioning waste. Any effect on disposal rates pertaining to issues other than these assumptions are not considered.

Disposal Rate

Disposal rates, as used in this study, include surcharges for various types of packages and special handling charged by the LLRW disposal facility typical in decommissioning operations. The rates do not include costs incurred by the utility for structure, system, and component removal and packaging, and transportation to the disposal site.

Escalation and Inflation

The disposal rates identified are based on 2008 dollars with no escalators for inflation.

Scope of Low-Level Radioactive Waste Study

This study only addresses disposal rates for large volumes of LLRW, as defined by 10 C.F.R. 61.55, generated by power utilities during the decommissioning of a nuclear generation facility. The rates identified in this study are distinct from higher rates that may be associated with smaller waste volumes from generators such as medical, research, academic institutions, or operating commercial power plants. Additionally, the study does not include low-level mixed waste, which is waste regulated by the U.S. Environmental Protection Agency and the U.S. Nuclear Regulatory Commission, Intermediate Waste, such as Transuranic Waste or High Level Waste, such as reactor fuel. These types of waste are not relevant to this study

Technical Discussion

Low-Level Radioactive Waste Disposal Methods

The disposal rates in this study are for waste buried utilizing current LLRW disposal methods, which are similar to methods used in conventional landfill operations. Class A waste is brought in by rail or truck, it is offloaded by dumping or mechanical lifting, and is placed in an above-ground disposal cell and covered with impermeable clay. The disposal containers for Class B and C wastes are placed inside additional concrete receptacles.

Low-Level Radioactive Waste Disposal Rates

The disposal rates in this study are approximate disposal rates that could be obtained for a current decommissioning project. The rates do not reflect any impact arising from future regulatory changes, changes in operational efficiencies, or technical advances.

Use of Low-Level Radioactive Waste Processors

Waste processors play a vital role in the waste disposal value chain. Processors either change the form and packaging of the waste or reduce the radioactivity content of the received waste through their unique processes. A processor may perform services at a generator's site or operate from an off-site fixed-base facility. A fixed-base facility is licensed by the state in which the processor resides to perform certain processing functions. Waste processed on a generator's site is usually shipped directly to a disposal facility after processing. For waste processed at a fixed-base facility, the waste is transported from the generator's facility to the processor facility, processed into a form acceptable for disposal, and then shipped to the disposal facility.

Processors that currently operate from fixed-base facilities include EnergySolutions, Impact Services, and Swedish owned Studsvik, all operating in Tennessee; Permafix in Florida, Tennessee, and Washington; and Diversified Scientific Systems, Inc. (DSSI) in Texas. The price a processor pays to the disposal facility is based on the volumes it expects to dispose of after processing. These rates are usually favorable because of large volume projections. Small generators of LLRW, commercial power units, and decommissioning sites utilize processors for the following reasons: limited volumes of waste generated, site license restrictions, facility footprint or environmental restrictions, restricted access to disposal facilities, and/or site core competencies. A utility uses a processor when it is cost-effective to do so.

Market Trends in Low-Level Radioactive Waste

- Disposal

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (the Amendments Act), required States to form disposal agreements or compacts with other States, and to develop regional LLRW disposal facilities. In addition, the Amendments Act made the U.S. Department of Energy (DOE) the legal guardian of GTCC and Reactor Fuel.

California, Arizona, North Dakota, and South Dakota formed the Southwestern LLRW Compact. California was designated to host the regional disposal site for the Southwest Compact at the Ward Valley site. However, this site failed to open. If Ward Valley had opened, the limited volumes generated from the Southwest Compact and the cost of operating the site would have made the waste disposal rate exceed \$1,000.00 per cubic foot, far more than current price schedules for the majority of decommissioning waste

EnergySolutions owns and operates the Clive Disposal Facility. It is the largest LLRW disposal facility in the United States. The site accepts Class A waste from commercial generators in California. Large volumes of Class A waste and relatively low site operational costs have made the cost of Class A waste disposal at Clive lower than at any previous disposal facility during the past three decades.

However, the EnergySolutions facility is not licensed for disposal of Class B and Class C waste. On July 1, 2008, the Barnwell Disposal Facility, owned by the State of South Carolina and operated by EnergySolutions, closed to generators outside of the Atlantic Compact. The Barnwell site accepted Class A, B, and C waste. The biggest effect of this closure upon California LLRW generators will be the loss of access for disposal of Class B and Class C waste.

- **Waste Storage and Waste Minimization**

The majority of LLRW material is Class A waste. As of July 1, 2008, all commercial generators except those in Atlantic Interstate LLRW Management Compact states need alternatives for Class B and Class C waste. Alternatives to disposal are storage and waste minimization. When waste is disposed of, title to the waste is transferred to the disposal site operator, and the waste is packaged and classified in accordance with federal rules. In contrast, when LLRW is stored, the title and liability remain with the generator. There are no regulations governing how LLRW is to be packaged or classified for storage. Storage is performed onsite at a generator's facility, or held offsite at a vendor's facility. To reduce the impact of limited disposal options for Class B and C waste, generators will need to seek storage options and increase their waste minimization options. Storage costs are unique to many variables, may be speculative, and are not included in this study.

- **Onsite Storage**

Many utilities and larger industrial facilities will manage their Class B and Class C waste in existing storage facilities or will need to construct such facilities at their sites. The NRC addressed the model for LLRW waste storage in SECY 81-38 "Storage of Low-Level Radioactive Waste at Power Reactor Sites", dated November 10, 1981. Many nuclear utilities have prepared for onsite or vendor facility storage in anticipation of limited access to disposal. Moreover, utilities have not alternative but to store used nuclear fuel onsite until a national repository is developed by the U.S. Department of Energy. California LLRW generators will have to determine their own storage needs.

- **Offsite Storage**

For generators that do not have adequate resources to build onsite facilities, waste vendors such as Waste Control Specialist and Studsvik are attempting to build and license facilities to accommodate LLRW, including Class B and Class C waste. Waste Control Specialist in Texas is finalizing licenses and vendor contracts to store all classes of LLRW in lieu of disposal. Rates for storage are anticipated to be approximately the same as for Class B and Class C waste disposal at the Barnwell facility. However, at some point stored materials will most likely need to be “disposed of” and likely incur additional cost.

- **Waste Minimization**

Generators can reduce disposal and storage costs by minimizing the volumes of the most expensive wastes, Class B and Class C. Commercial utilities have made significant progress through radioactive waste management and system engineering in reducing the volumes of Class B and Class C waste generated during plant operations. This action will likely further reduce the overall volumes of Class B and Class C waste during decommissioning. (ref 6)

Investigation and Analysis of Results

This section investigates existing disposal facilities, their long-term disposal capacities, base rates, future trends for disposal site development, and site access.

Existing Disposal Facilities, Capacities, and Trends

As previously cited, access to disposal facilities is limited for California waste generators. Additionally, disposal rates at various facilities are not standard. The following discussion validates this position and further supports the burial rate concluded in this study.

1. Washington LLRW Disposal Site – Richland, Washington

The Richland disposal facility is situated on 100 of the 1000 acres leased by the State of Washington within the 540 square miles of the DOE’s Hanford facility. It is located in Benton County, Washington, approximately 25 miles from Richland. Washington is the host state for the Northwest Compact and has been closed to non-compact LLRW since 1993. The waste received is generated from universities, hospitals, and nuclear power plants. The site accepts all classes of waste. The fee structure for these generators includes an annual site access fee based on an annual volume and container dose-rate, a per shipment fee for paperwork review (manifest), a volume rate, and other associated fees for site operations, special burial canisters, and large components. The Richland site disposal rate schedule is at Appendix A, Exhibit A.1. (ref 7)

2. EnergySolutions – Clive, Utah

The lowest disposal rate for Class A waste among the commercial facilities is at Clive. Pricing for commercial customers has ranged from \$40 to more than \$400 per cubic foot. EnergySolutions does have a published price schedule, see Appendix A, Exhibit A.3, but in reality, most contracts for disposal are unique to the customers committed volume and specifics to contract negotiations. Information used to identify a burial rate for this study was obtained from California utility generators under confidentiality. The rates identified in this study are average rates and not specifically identified to a specific generator. The Clive disposal facility currently receives approximately 99% of all Class A waste generated in the United States. EnergySolutions claims that more than 50 million cubic feet of disposal capacity remains available. EnergySolutions has no plans for developing a disposal facility for Class B and C waste.

3. Chem-Nuclear LLRW Disposal Site – Barnwell, South Carolina

The Barnwell facility is a 235 acre facility in Barnwell County, South Carolina. Effective July 1, 2008, and until about 2050, Barnwell will accept all classes of waste but only from states in the Atlantic LLRW Management Compact (i.e., Connecticut, New Jersey, and South Carolina). The Barnwell site is like the Richland site in that it is licensed to accept Class A, B, and C wastes.

Barnwell has the highest disposal rates among the three existing LLRW commercial facilities across all three classes of waste. For non-Atlantic Compact generators, disposal rates for Class A waste are two-to-three times higher than at the Clive or Richland facilities, and rates for Class B and Class C waste are three-to-four times higher than at the Richland facility. The differences in rates are due primarily to increases in state-imposed special fees, taxes, and surcharges. The disposal rate schedule for the Barnwell site, for non-Atlantic Compact waste, is shown in Appendix A, Exhibit A.3.

4. Waste Control Specialists – Andrews, Texas

Waste Control Specialists LLC (WCS) is located in West Texas, adjacent to the border with New Mexico, and about 30 miles east of the Waste Isolation Pilot Project. WCS operates a 1338 acre facility in Andrews County. The WCS facility has permits for the treatment, storage, and disposal of radioactive, hazardous, and toxic waste. WCS is primarily dedicated to the treatment, storage, and disposal of DOE LLRW and Mixed Waste, and commercial decommissioning waste.

Currently, WCS can only accept waste generated in the state of Texas and certain Department of Energy (DOE) waste for disposal. The site capacity is approximately 60 million cubic feet for disposal. If fully licensed for disposal, this facility would accommodate all classes of LLRW and Mixed Waste. No price schedule is available. Sources suggest that planned disposal pricing would be competitive with current

Barnwell pricing for Class B and Class C waste, and with Clive pricing for Class A waste. (ref 8)

Recently, WCS entered into agreements with waste processors to prepare waste for long-term storage. The storage of waste would be applicable to all classes of waste, including Class A, Class B, Class C, and GTCC from all waste generators including California utilities. Currently, however, storage can only be for up to one year. WCS is submitting a request to the Texas Commission on Environmental Quality (TEQ) for a license amendment to store waste longer. The rate is expected to be consistent with Barnwell disposal pricing identified in Table 3.

5. Ward Valley, California

The Ward Valley disposal facility that was to have been located in San Bernardino County, California was to be the regional compact disposal facility for the Southwestern LLRW Disposal Compact States. This facility never opened and is not likely to ever open.

6. DOE Waste Disposal Facilities

The DOE owns three primary disposal sites for legacy waste generated during the Cold War era. The sites are in Richland, Washington; Beatty, Nevada; and Savannah River, South Carolina. Many parties have proposed that these facilities are well-suited to bury Class B and Class C wastes from commercial generators. To date, however, the DOE has expressed no interest in opening these facilities to commercial generators, and regardless of capacity, contends that LLRW disposal is a state issue DOE waste disposal pricing is in the range of \$10 - \$20 per cubic foot. However, DOE pricing has not to date been made available to commercial LLRW generators.

Access to Disposal Facilities – Probability for Direct Disposal

The following table summarizes a commercial generator's ability to access a LLRW disposal site. This table demonstrates that few sites are available to most generators, including utilities in decommissioning. The table also addresses the probability of access to sites in the future. Additionally, a weighting factor or probability scale correlates the sites with the class of waste each can currently receive or could receive in the future. A weighting factor of 0 suggests no reasonable possibility of future access. A weighting factor of 4 suggests full access to the site indefinitely.

The weighting factor scale in table 1 summarizes findings from news media, current industry events, information gathered at industry conferences, collaboration with industry experts, disposal site executives, and industry experience and knowledge. The bases and assignment of weighting factors (probability) is based on reasoned judgment.

Table 1 – Probability for Direct Disposal at Licensed Facilities

Disposal Facility	Currently Accessible	Future Accessibility	Weighting Factor for Class A	Weighting Factor for Class B&C	Comments
Barnwell	No	No	0	0	Non-Atlantic Compact states phased out effective July 1, 2008. State of South Carolina legislative action would be required for future access. 90% of existing capacity committed.
EnergySolutions	Yes	Yes	4	0	Large existing capacity for Class A waste from non-Compact states. State of Utah blocked license for Class B and Class C wastes. Many nuclear plants have signed "Life-of-Plant" contracts.
Texas	No	Possible	1	1	WCS Facility in Texas will first be available for LLRW disposal to Texas Compact states. Future access by non-Texas Compact states may be limited to storage at disposal prices.
Washington	No	No	0	0	State of Washington statute would have to be overturned for future access. Many prior overtures have been rejected.
Southwestern LLRW Compact	No	No	0	0	Transfer of Ward Valley, California site from U.S. Dept. of the Interior to State of California was never completed. No other sites currently under consideration.
DOE Sites	No	No	0	0	DOE has no known plans to accept commercial LLRW at its disposal facilities.

Low-Level Radioactive Waste Disposal Rates

To conservatively estimate LLRW disposal rates for commercial utilities engaged in decommissioning, the following assumptions apply:

- First, approximately 90% of all radioactive waste is Class A, 5-6% is Class B, 4-5% is Class C, and 1% is GTCC. (ref 7.1.11).
- Second, all Class A waste is profiled according to the pricing categories at EnergySolutions as follows: A large majority of Class A waste is buried in the Bulk Waste Facility (BWF), the remaining quantity is considered General Class A waste. General Class A waste typically includes 68% as large components, 12% as higher activity and must be managed in the Containerized Waste Facility, and 20% as high density or oversized debris
- Third, the volumes of waste are consistent with those identified in other decommissioning cost studies. The actual volumes will vary based on factors such as method of initial volume estimate, waste packaging efficiencies, modes of transportation, site restoration requirements, and contributions of non-radioactive waste to the total.

Table 2 represents Class A disposal rates from all disposal facilities and includes the various disposal rates at EnergySolutions weighted proportionately by anticipated decommissioning volumes. For EnergySolutions, a Bulk Waste Rate and an aggregate disposal rate from all categories of General Class A waste is provided. The disposal rate for General Class A waste is determined by multiplying the projected volumes of each category of General Class A waste times the associated rates to yield an aggregate disposal rate for all General Class A waste.

Table 2 Disposal Rate for Class A Waste**Disposal Rate for Class A Waste Categories**

EnergySolutions (ES)				
General Class A Waste	Projected % of Volume	Disposal Rate	Volume Adjusted Rate	Disposal Rate
Containerized Waste	12.00%	\$229	\$27	
High Density/Oversize Debris	20.00%	\$128	\$26	
Large Components	68.00%	\$250	\$170	
Weighted Average; General Class A Waste	100%		\$223	\$223
Bulk Class A Waste				\$57
Barnwell				\$381
Texas				\$381
Washington				\$152
SW LLRW Compact (Estimated)				\$1,200
DOE Sites (Average)				\$20

In Table 2, EnergySolutions' bulk waste is that waste which is buried most like in a normal landfill. This waste is the least hazardous of the Class A waste received. The Containerized Waste Facility receives waste which, because of radioactive content, needs to be managed with greater radiological controls. Large components are items from decommissioning such as large pumps and heat exchangers. High density and oversized debris waste require special handling and are priced accordingly.

Table 3 – Facility Disposal Rates for All Waste Classes

Table 3 represents the average burial rate for all classes of waste at each respective facility without regard to accessibility weighting factors (ref 3). The grey shaded area in the table reflects that EnergySolutions only accepts Class A waste, and there is no Class B or Class C pricing

Dollars per Cubic Foot (2008\$)

	Class A	Class B	Class C
Barnwell	\$381	\$2,915	\$2,915
EnergySolutions Bulk Class A Waste	\$57		
EnergySolutions General Class A Waste	\$223		
Texas	\$381	\$2,915	\$2,915
Washington	\$152	\$440	\$808
Southwestern LLRW Compact (Estimated)	\$1,200	\$3,000	\$3,000
DOE Sites (Average)	\$20	\$20	\$20

Table 3 assumes a price per cubic foot regardless to accessibility and, in the case of Ward Valley an estimated price. DOE sites are not available commercially, but are included anyway. Additionally, DOE has no classification system, hence, DOE's pricing is not class driven.

Table 3a

Table 3a summarizes the table 3 disposal rates adjusted for fees imposed by the State of Utah and the Southwest Low Level Compact Commission (SWLLCC). The State of Utah fee is 5% for Bulk Class A and 12% for General Class A. The fee for SWLLCC is \$1.35 per cubic foot for all waste regardless of waste class.

Table 3a**Average Disposal Rate With Fees**

	Utah Tax	*SWLLCC	Rate	Total
Bulk Class A	5%	\$1.35	\$57.00	\$61.20
General Class A	12%	\$1.35	\$223.00	\$251.11
Class B/C		\$1.35	\$2,915.00	\$2,916.35

*Southwest Low Level Compact Commission

Conclusions

Many variables exist when determining a disposal rate for decommissioning waste. Disposal rates are dependant on the class of the waste, the form of the waste and access to disposal sites. Historical access to disposal facilities has changed based on states' alignment in regional compacts. Barnwell is now closed to non-compact generators and no new facility is yet licensed to replace it. For the foreseeable future, LLRW generators will have to store Class B and Class C waste on site or seek storage options offsite at facilities such as WCS. The majority of decommissioning waste is Class A and the Clive disposal facility is open to California commercial generators for disposal. From Table 3 and Table 3a the total, the disposal rate for Bulk Class A waste (rounded up) is \$62.00 per cubic foot and \$252.00 per cubic foot of other General Class A Waste. The disposal rates for Class B and Class C decommissioning is \$2,917 per cubic foot. While no disposal site exist for California LLW generators of Class B and C waste, the best estimate is based on the previous Barnwell disposal rate or the proposed Texas rate.

Appendix A

Exhibit A.1 US Ecology Washington, Inc., Radioactive Waste Disposal, Schedule of Charges

(NUREG 1307 Rev 12)

Exhibit A.2 South Carolina Budget and Control Board, Uniform Schedule of Maximum Disposal Rates For Atlantic Compact Regional Waste

(NUREG 1307 Rev 12 for reference only, not used in this report)

Exhibit A.3 2 South Carolina Budget and Control Board, Uniform Schedule for Maximum Disposal Rates For non-Atlantic Compact Waste

(NUREG 1307 Rev 12)

Exhibit A.4 EnergySolutions, Schedule C, and C-1 Rate Schedule